

REMARKS

Claims 5, 8, and 10 are pending in this application. Claims 5 and 8 are amended and claim 10 is added. Support for the amendments may be found in the specification at page 15, line 22 to page 16, line 10.¹ No new matter is added.

In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

I. Rejection Under 35 U.S.C. §103

The Office Action rejects claims 5 and 8 under 35 U.S.C. §103(a) as having been obvious over U.S. Patent Application Publication No. 2003/0207979 to Sato et al. ("Sato") in view of U.S. Patent Application Publication No. 2002/0013393 to Lewin ("Lewin") and U.S. Patent Application Publication No. 2003/0207106 to Nakamura et al. ("Nakamura"). The rejection is respectfully traversed.

Claims 5 and 8 are each directed to a wiring harness comprising a wire bundle that comprises non-halogenous insulated wires. The non-halogenous insulated wires each comprise a conductor covered with a crosslinked flame-retardant resin composition. The crosslinked flame-retardant resin composition comprises (among other things): (1) a resin ingredient containing polyethylene of which a melt flow rate (MFR) is 5 g/10 min or less and a density is 0.90 g/cm³ or more; and (2) zinc sulfide. The crosslinked flame-retardant resin

¹ Specifically, the specification teaches that "general additives may be added as appropriate if necessary" (emphasis added) and names nitrogen-containing flame-retardant auxiliary agents as such additives. Implicit in this teaching is that nitrogen-containing flame-retardant auxiliary agents need not be included in the recited crosslinked flame-retardant resin composition. Accordingly, the specification supports excluding flame-retardant nitrogen-containing auxiliary agents from the scope of the claims. Additionally, the specification exemplifies crosslinked flame-retardant resin compositions that do not comprise nitrogen-containing flame-retardant auxiliary agents. See pages 33-36, Tables 1-4. The Office Action further asserts that ammonium polyphosphate (APP) is a nitrogen-containing flame-retardant adjuvant. See page 11. Thus, the specification supports claim 10 because the Office Action views APP as a species of nitrogen-containing flame-retardant adjuvants.

composition does not comprise a nitrogen-containing flame-retardant auxiliary agent. The applied references would not have rendered obvious the claimed wiring harnesses comprising the recited crosslinked flame-retardant resin composition for at least the following reasons.

A. Lewin Does Not Establish a Reason to Provide ZnS Separate from APP

Sato is directed to a resin composition that, among other things, comprises a polyethylene having a melt flow rate of about 5 g/10 min at the most and a density of at least 0.930. See abstract and paragraphs [0024]-[0086] and [0107]. Sato is completely silent regarding a resin composition that comprises zinc sulfide.²

Lewin is directed to flame-retarding additives that provide flame retardation to polymeric compositions comprising fillers, such as glass fillers. See abstract. Lewin teaches that the polymeric compositions are provided with a flame-retarding additive that comprises the combination of (1) at least one polyphosphate, (2) a sulfur-containing compound, (3) a catalyst, and (4) a nitrogen-containing compound, such as melamime. Id. Lewin teaches that the polyphosphate for use in its flame-retarding additive is mainly, if not entirely, ammonium polyphosphate (APP). See paragraph [0017]. Ammonium polyphosphate is primarily responsible for providing flame retardancy to the polymeric composition. Id.

Moreover, Lewin teaches that "It has been surprisingly been found, that a high degree of flame retardancy can be imparted to glass fiber-containing polymers by using APP without char-forming agents, but with relatively small amounts of metal-based catalysts and of sulfur

² The Office Action denies that it asserts that it would have been obvious to substitute zinc boride of Sato's resin composition with zinc sulfide (as disclosed by Lewin). See Office Action at pages 12-13. However, the Office Action continues to point to Sato's disclosure of "zinc compounds" (i.e., zinc borate) in formulating the rejection. See Office Action at page 4 (copying the body of the rejection from previous Office Actions). Nonetheless, it is believed that the Office Action is no longer asserting that Sato's teaching of zinc borate would have led an ordinarily skilled artisan to combine the teachings of Sato and Lewin in an attempt to arrive at the recited crosslinked flame-retardant resin composition of claims 5 and 8.

compounds." See paragraph [0007]. More specifically, Lewin teaches that "It has been surprisingly been found that already small amounts of ZnS, in the range of 1-3 weight % of a polymer composition, yield a pronounced flame retardancy effect." See paragraph [0011].

In this context, Lewin emphasizes that "this is the most striking feature of this invention, that the addition to an ammonium polyphosphate-based formulation of a relatively small amount of certain sulfur derivatives brings about a dramatic enhancement of the flame retardant effectivity of the system." See paragraph [0007]. Lewin explains that "The sulfur derivative appears to be a more effective catalyst for the dehydration, cross-linking and char formation than APP alone." See paragraph [0009]. Lewin further explains that "The char is formed both by the sulfation and the phosphorylation routes." Id. Thus, Lewin describes the sulfur compounds as "synergists" of APP. Id. In contrast, Lewin also teaches that "a certain degree of flame retardancy is obtained according to the present invention with APP also without the sulfur derivative." See paragraph [0016].

Thus, Lewin teaches that providing the combination of ammonium polyphosphate and zinc sulfide (as compared to providing only ammonium polyphosphate) improves flame retardancy of glass-fiber-containing polymers. Contrary to assertions contained in the Office Action, Lewin does not teach that zinc sulfide alone achieves a certain degree of flame retardancy. See Office Action at pages 11-12 (asserting that Lewin teaches that (1) it is known that zinc sulfide is used in and compatible with polymers, and (2) during combustion, zinc sulfide renders a polymeric surface flame retardant).

As discussed above, the recited crosslinked flame-retardant resin composition does not comprise a nitrogen-containing flame-retardant auxiliary agent. The Office Action asserts that Sato teaches that other flame retardants may be included in its resin composition, including nitrogen-type flame-retardant adjuvants. See Office Action at page 10; Sato at paragraph [0111]. The Office Action further asserts that ammonium polyphosphate is a

nitrogen-containing flame-retardant adjuvant. See page 11. The Office Action alleges that it would at least have been obvious to add the combination of ammonium polyphosphate and zinc sulfide to Sato's resin composition in view of the teachings of Lewin. See pages 10-12. Without conceding to the propriety of the Office Action's assertions, the recited crosslinked flame-retardant resin composition does not comprise a nitrogen-containing flame-retardant auxiliary agent and, thus, the Office Action's assertions are moot. Nakamura fails to cure such deficiencies of Sato and Lewin.

For at least the above reasons, the Office Action fails to establish a *prima facie* case of obviousness.

B. Unexpected Results Are Due to Combination of Polyethylene and ZnS

Regardless of whether or not *prima facie* obviousness is established, non-halogenous insulated wires that use the recited crosslinked flame-retardant resin composition are compatible with vinyl chloride insulated wires, which compatibility is completely unexpected over the teachings of Sato, Lewin, and Nakamura. The compatibility is due to the combination of (1) polyethylene of which a melt flow rate (MFR) is 5 g/10 min or less and a density is 0.90 g/cm³ or more, and (2) zinc sulfide. See specification at page 18, lines 7-14 ("In particular, compatibility, one of the important properties of the composition, is exerted by using (A) the polyethylene specified by the specific melt flow rate (MFR) and the specific density and (D) the zinc compound, preferably zinc sulfide. If, for example, polypropylene which is also polyolefin is used instead of (A) the polyethylene, compatibility is not exerted at all or sufficient compatibility cannot be obtained.").

Comparative Examples 19-22, especially Comparative Examples 21 and 22 in which zinc sulfide is provided in the resin composition, exemplify that using polypropylene instead of polyethylene results in compositions that are not compatible with vinyl chloride insulated

wires. See page 36, Table 4. As discussed in the specification, "the Comparative Examples 19 to 22, in which polypropylene is used as the (A) ingredient instead of using the polyethylene of which the melt flow rate (MFR) is 5 g/10 min. or less and the density is 0.90 g/cm³ or more, does not satisfy compatibility even if the zinc compound is added thereto as the (D) ingredient." See page 38, lines 21-26.

In comparison, all Examples 1-20 are directed to compositions that comprise the combination of (1) polyethylene of which a melt flow rate (MFR) is 5 g/10 min or less and a density is 0.90 g/cm³ or more, and (2) zinc sulfide. As discussed in the specification, "it was shown that the crosslinked flame-retardant resin compositions, the non-halogenous wires, and the wiring harnesses consistent with the Examples are excellent in all of flame retardancy, wear resistance, flexibility, workability, and compatibility." See page 38, line 27 to page 39, line 6. This superior compatibility is completed unexpected over the teachings of Sato, Lewin, and Nakamura because the references do not disclose resin compositions that have such compatibility.

For at least the above reasons, non-halogenous insulated wires that use the recited crosslinked flame-retardant resin composition provide unexpected results, demonstrating the nonobviousness of the claimed wiring harnesses.

C. Conclusion

For at least the above reasons, the applied references would not have rendered obvious claims 5 and 8. Reconsideration and withdrawal of the rejection are respectfully requested.

II. New Claims

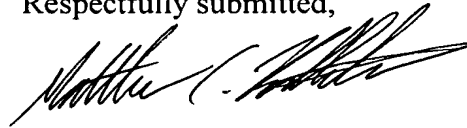
Claim 10 is newly presented. Claim 10 requires that "the crosslinked flame-retardant resin composition does not comprise ammonium polyphosphate (APP)" and, thus, patentably distinguish over the applied references for reasons discussed above with respect to claims 5 and 8. Prompt examination and allowance of claim 10 is respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

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